

Update on HCal field after- burner and new SPACAL verification

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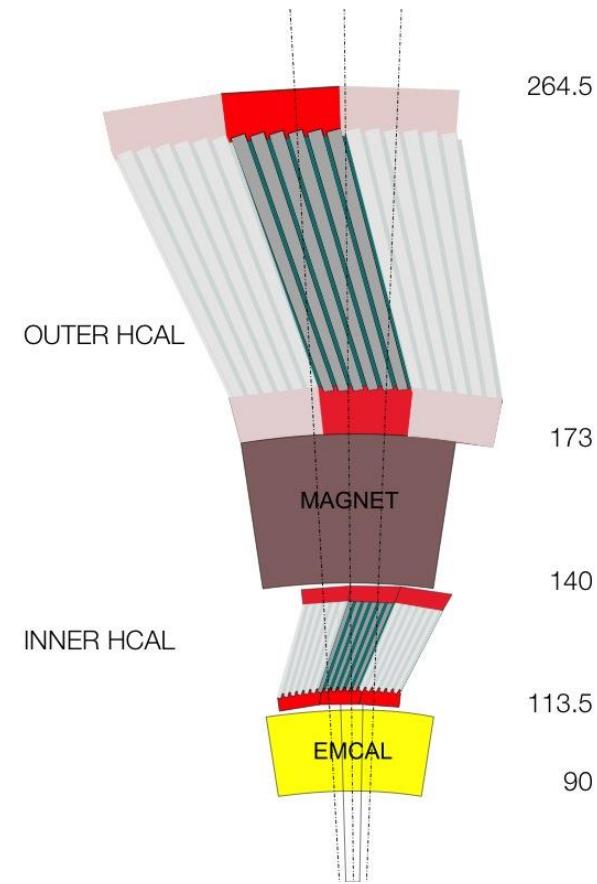
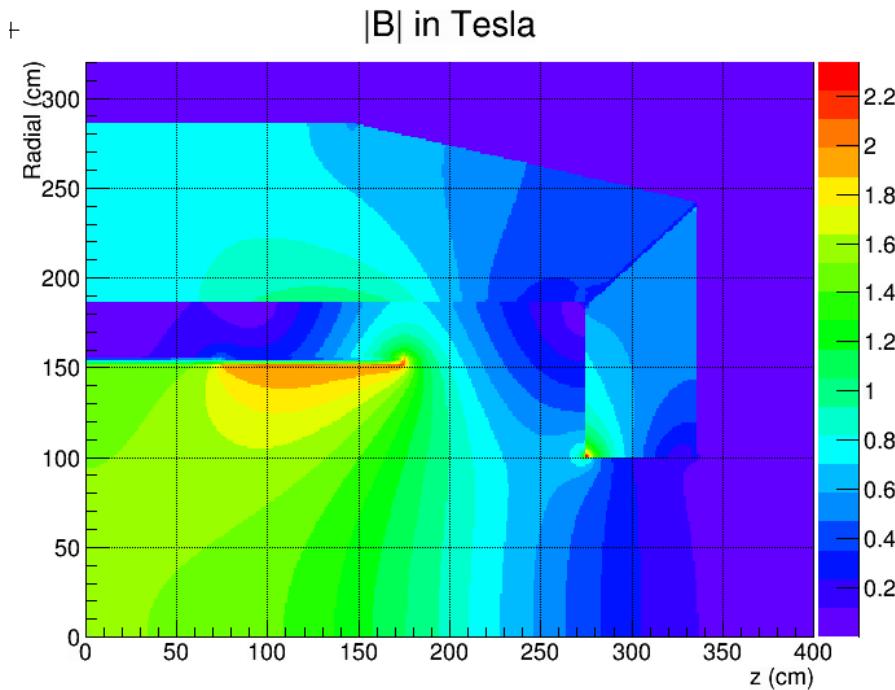
Correcting the field in Hcal with an after-burner



2D field calculation for sPHENIX

On RCF : /phenix/upgrades/decadal/fieldmaps/bPHENIX.dp.root

By Achim with Opera and calculated in 2D

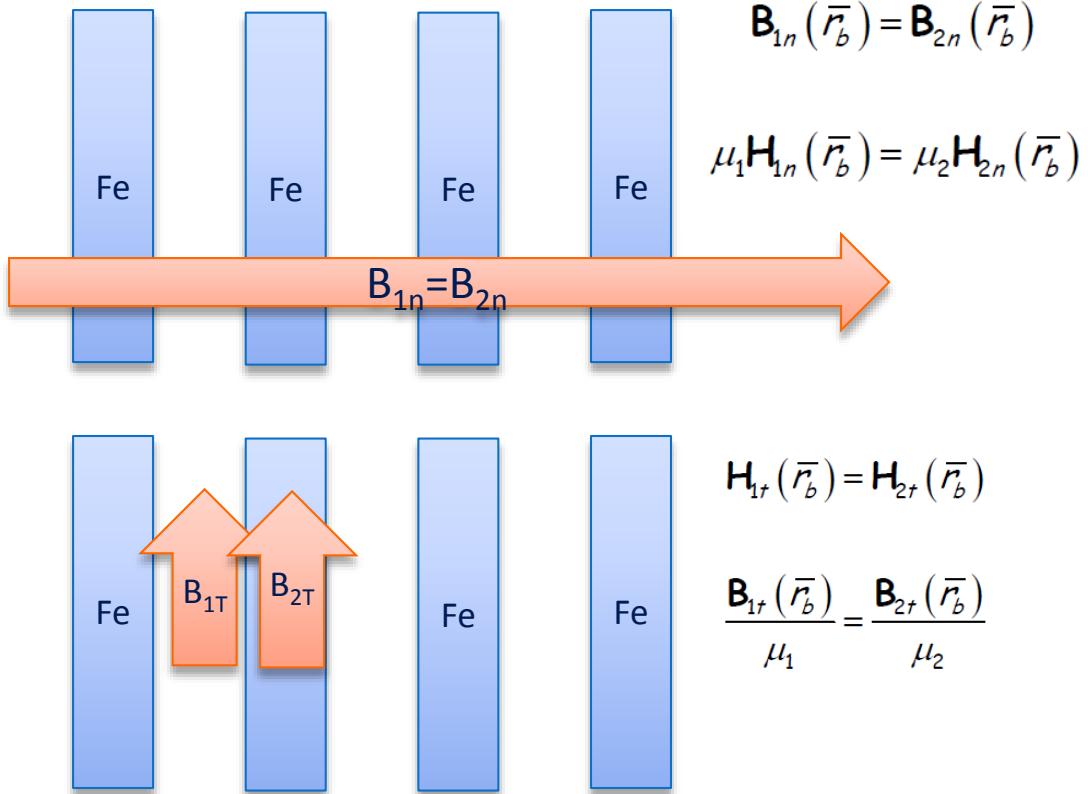


Magnetic field in alternating medium

Steel 1006 relative permeability

<http://www.fieldp.com/magneticproperties.html>

- ▶ Steel 1006 ($B_s = 2.13$)
- ▶ $B \quad \text{MuR}$
- ▶ (tesla)
- ▶ =====
- ▶ 0.0000 1530.0000
- ▶ 0.6416 2138.6047
- ▶ 0.7873 1968.1677
- ▶ 1.0596 1513.6877
- ▶ 1.2397 1239.6501
- ▶ 1.3960 930.6706
- ▶ 1.4629 731.4435
- ▶ 1.5562 518.7375
- ▶ 1.6184 404.5879
- ▶ 1.6509 330.1898
- ▶ 1.7071 243.8759
- ▶ 1.7669 176.6945
- ▶ 1.8479 123.1962
- ▶ 1.9121 95.6031
- ▶ 2.0110 67.0341
- ▶ 2.1060 42.1198
- ▶ 2.1660 30.9430
- ▶ 2.2130 22.1301



Implemented in

<https://github.com/sPHENIX-Collaboration/coresoftware/blob/HCalField/simulation/g4simulation/g4detectors/PHG4OuterHcalField.cc>

Update after meeting:

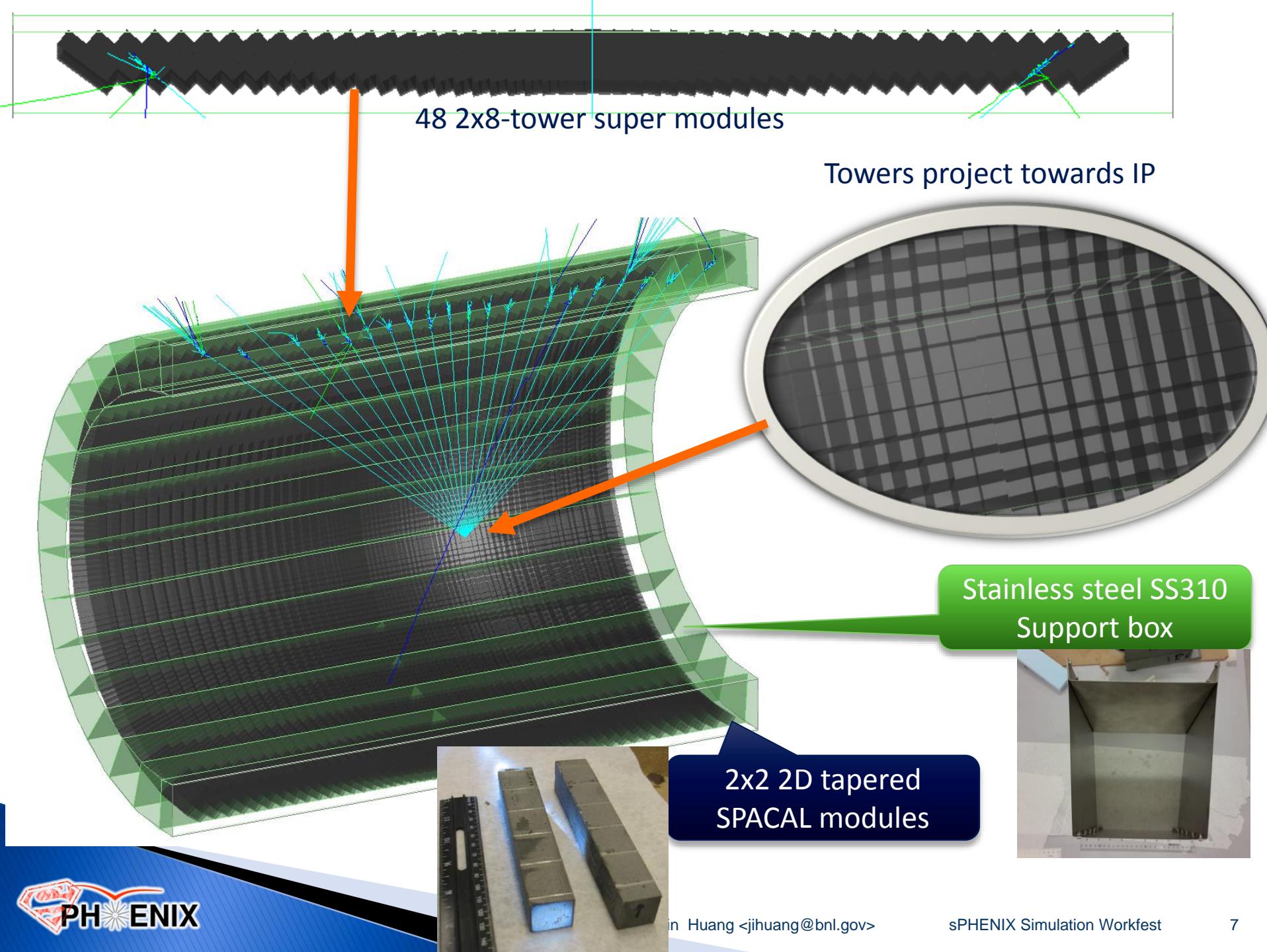
Tom pointed out that iron will modify the average field to bend along it metal fin

Status

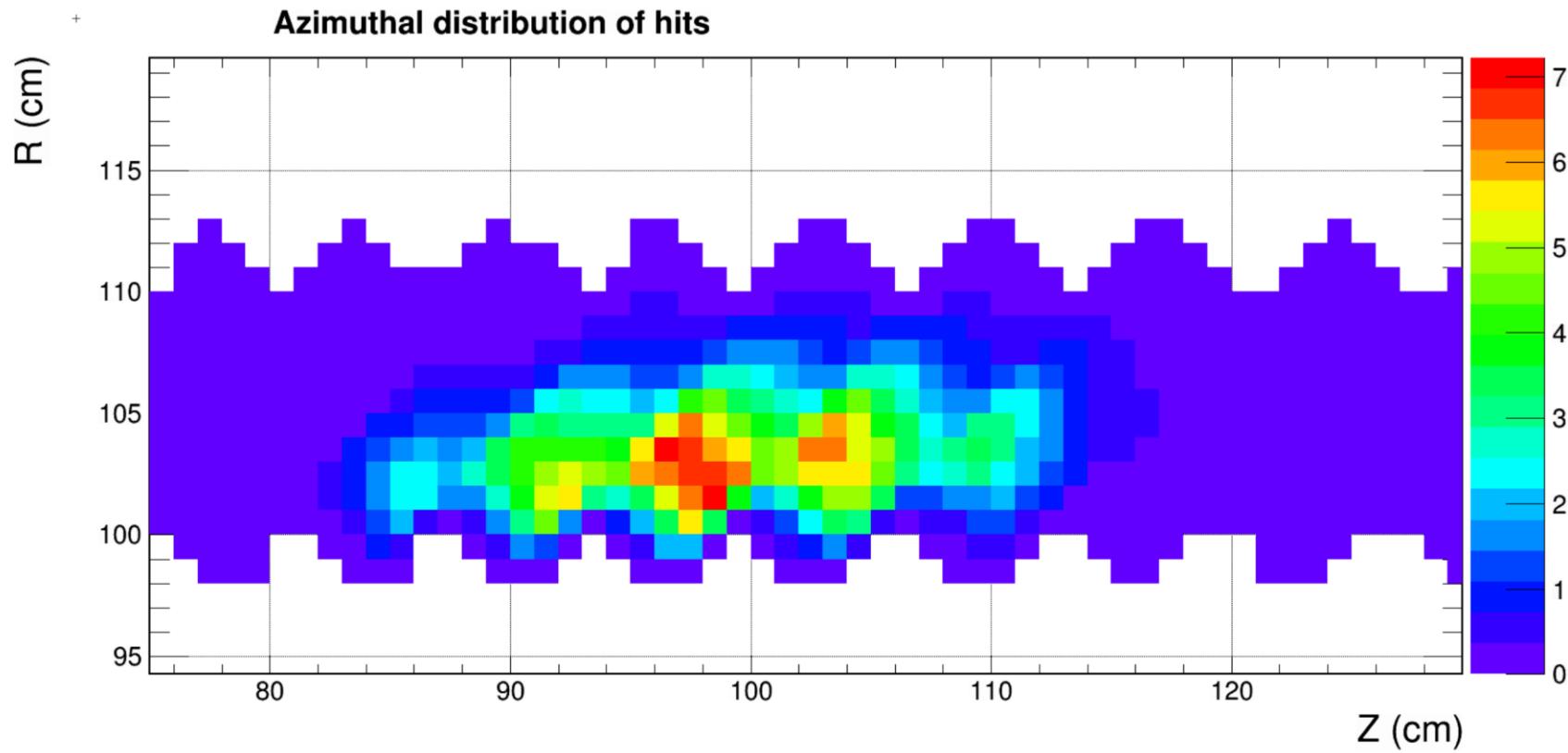
- ▶ Uploaded to evaluation branch
 - <https://github.com/sPHENIX-Collaboration/coresoftware/>
 - Tmp evaluation branch : HCalField
- ▶ Need to verify with Chris on sign definitions for rotation angle
- ▶ Need to test to verify the field map experience by particle
- ▶ Checkout if any effect

Verifying New Projective Spacal

- » On development branch
2DSpacal

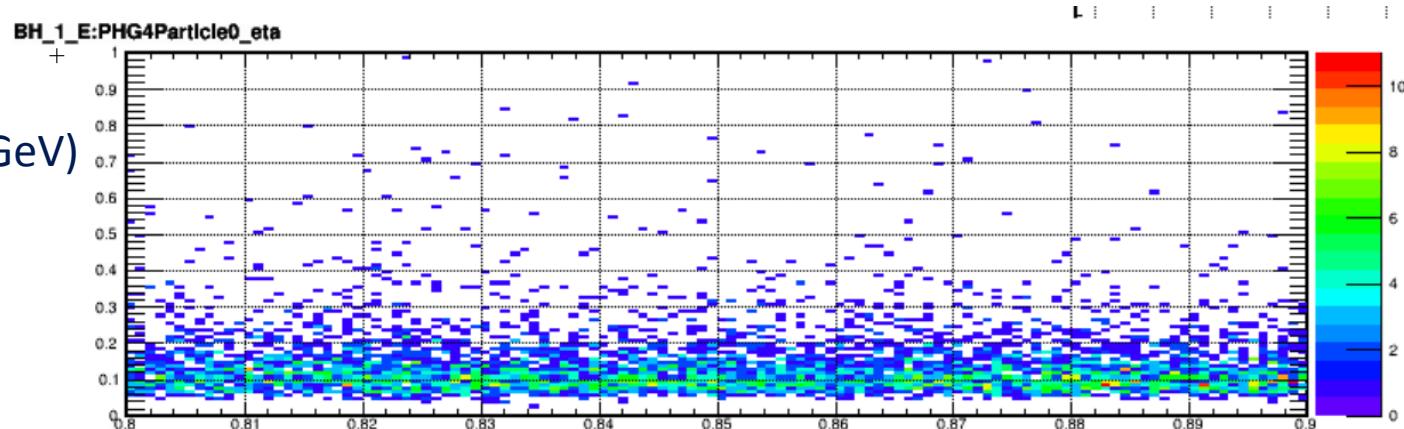


Energy distribution, $p = 5\text{GeV}$ electron in sPHENIX field



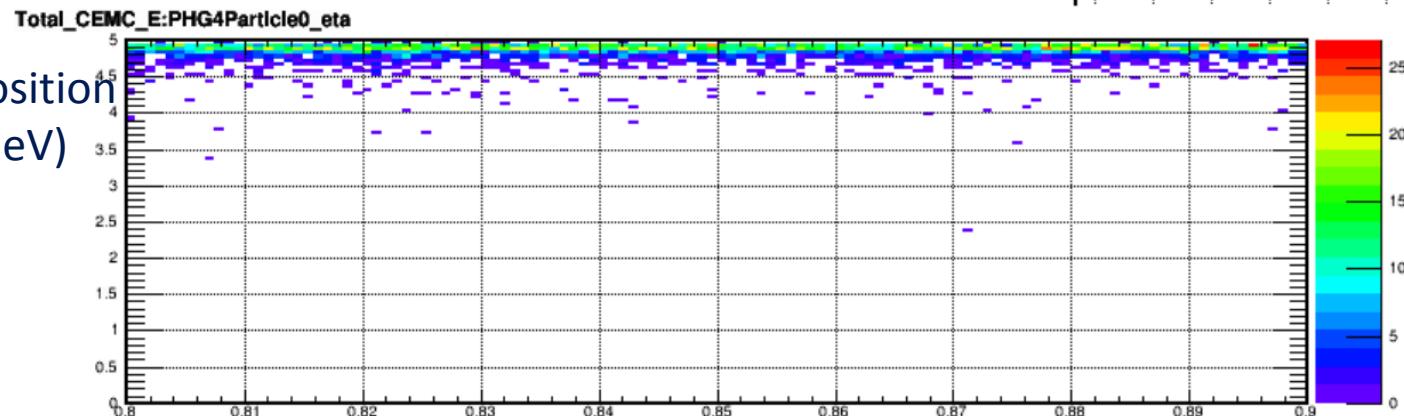
Looks smooth so far (vs eta)

Leakage (GeV)



Eta

Energy deposition
in SPACAL(GeV)



Eta